

REMARKS

Claim Rejections – 35 USC § 103

The Office has quoted the statute from 35 USC 103(a), which is referenced herein. The Office has rejected claim 1, 3, 4, 5, 6, and 7 as being unpatentable over Ishida et al. (US 5,766,364) in view of Wang et al. (US 6,538,872) and Zhao et al. (US 6,189,482). Applicant has carefully considered the Office rejections and respectfully submits that the amended claims, as supported by the arguments herein, are distinguishable from the cited reference.

According to the MPEP §2143.01, "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in either the references themselves or in the knowledge generally available to one of ordinary skill in the art."

A useful presentation for the proper standard for determining obviousness under 35 USC §103(a) can be illustrated as follows:

1. Determining the scope and contents of the prior art;
2. Ascertaining the differences between the prior art and the claims at issue;
3. Resolving the level of ordinary skill in the pertinent art; and
4. Considering objective evidence present in the application indicating obviousness or unobviousness.

First, the applicant submits that one of ordinary skill in the relevant art would not have combined the cited '364, '872, and '482 references. As these references have been in the public domain at least since 2003, and to the best of the applicant's knowledge they have not been combined by those in this field, while at the same time, the problems sought to be solved by the applicant's claimed invention have persisted and have been generally acknowledged, they clearly cannot have been obvious to one of ordinary skill in the art. Furthermore, the applicant submits

that the necessity found by the Office to combine the teachings of three references in the way employed by the Office, suggests non-obviousness rather than obviousness.

In contrast to the claimed invention, the applicant respectfully submits that the cited references, either alone or in combination fail to disclose a fluorine-cleaned plasma processing apparatus. In contrast to the claimed invention, the cited the '364 reference fails to disclose a fluorine containing gas, a gas delivery system configured for fluorine containing gas delivery.

In further contrast to the claimed invention is the alleged combination of the '364 reference with the '872 reference. In the '872 reference at the cited section (column 12 line 64 to column 13 line 2), the teaching is that the electrode comprises a "a refractory metal capable of withstanding high temperatures, such as temperatures of at least about 1500°C". The teaching is merely that a number of candidate high melting point metals could be considered for use as electrodes.

It is significant that the electrode of choice in the '872 reference is molybdenum. The use of molybdenum in the present application would be disastrous and entirely unworkable. If a molybdenum electrode were used in associating with fluorine-based cleaning, it would erode extremely quickly, indeed even visibly whilst observed, if it were in contact with a fluorine-containing plasma. Thus one of ordinary skill in the art would not be likely to base any proposed design on a reference such as the '872 reference and that of the '364 reference to yield the claimed invention. Indeed, the applicant strongly disputes that the '872 reference is combinable in any way with the '364 reference so as to arrive at the present claimed invention, not least due to the '872 reference's use of molybdenum as an electrode material which is entirely unsuitable for a fluorine-cleaned apparatus. Furthermore, there is no discussion in the '872 reference regarding either fluorine-cleaning or indeed suitability of any specific materials for use therewith and therefore the applicant respectfully submits that there is an absence of any teaching in the '872 which would provide a skilled person with useful information in attempting to arrive at the invention from the '364 reference.

It is clear therefore that the presence of a gas delivery system having a fluorine-containing gas and which is configured to supply the gas to the chamber, is not disclosed in the '872 reference (or indeed in the prior art of record). Thus we submit that the use of the '872 reference in an obviousness argument is not viable in the light of the amended independent claim 1.

The Office relies on the '482 reference as providing a disclosure of the specific dimension range claimed. The applicant respectfully and strongly disagrees with the Office upon this point. The Office refers to column 19 lines 45 to 55 as disclosing a heater thickness of 3 to 15 mm (actually the reference refers to "mil"). The independent claim 1 requires the distance Y to be between the upper surface of the first electrode and a first plane formed from essentially the uppermost parts of the heating members. This means of course that the distance Y, according to '482, has a minimum potential variation of 12 mil and we note further that the actual thickness of the heater (5 mil) is irrelevant to the calculation of Y itself. The thickness of the heater is of course relevant to the heater thickness X which we know to be 5 mil. Thus according to the independent claim 1 the distance Y would require to be 6 mil to 15 mil to fall within the independent claim 1. However, the aluminium nitride plate 105 is positioned in-between the components 103 and heating element 107. Thus the applicant respectfully disagrees with the Office's contention that the claimed range is disclosed by the '482 reference.

Upon this point, we wish to make it clear that although the '482 reference has chosen the wording "rf plane", any reasonable interpretation of the independent claim 1 of the present application would clearly require the "first plane" to be a plane in a mathematical sense as a geometrical construction with zero thickness.

The applicant also notes that the '482 reference is not readily combinable with the '364 reference anyway since it does not disclose fluorine-cleaned plasma processing apparatus.

Turning to the Office's comments regarding obviousness on the basis of substitution motivated by a reasonable expectation of success, with respect, the applicant does not agree that such an approach is valid in this case. Simply because the absence of an express suggestion to substitute

one equivalent for another may not confirm non-obviousness, the Office will appreciate that it likewise is not a confirmation of obviousness either. This precedent does not mean that simply any teachings can be combined; something more must be needed. The person of ordinary skill in the art would, in practice, require some direction or motivation to arrive at the claimed subject matter without inventive input. One must consider the circumstances in question – it is not obvious to try everything – and therefore one must ask what teaching would give the skilled person that “expectation of success” that the examiner readily attributes to the skilled person? Where is that teaching within each of the cited documents? The applicant submits that this is not merely a common sense substitution and obvious to try is on its face inadequate as an articulated reason for such a combination.

Furthermore, the assertion that the claimed range would be arrived at by simple substitution (even though the ‘482 reference does not assist in this) is incorrect since it presupposes that there is no advantage of one set of dimensions in comparison with another. The present application teaches that there is an unexpected advantage. The independent claim 1 requires certain dimension ranges due to the use of a nickel alloy and due to the use of fluorine-containing cleaning gases as is explained in the specification. There is simply nothing within the cited art which discusses the requirements for fluorine-cleaned processing apparatus and therefore it is unreasonable to simply assume that the invention is obvious. We therefore request that the examiner reconsiders this point with reference to the newly amended independent claim 1.

The applicant therefore submits that claims 1, 3-7 are patentably distinct from the cited references, either alone or in combination. The applicant respectfully requests that the rejections be withdrawn.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. (US 5,766,364) in view of Wang et al. (US 6,538,872), Toya et al. (US 6,043,468) and Wang et al. (US 6,660,975). The ‘364 reference and the ‘872 reference, and their alleged combination have been addressed at length above. To these deficient references, the Office adds the ‘468 and 975 references. Again, the applicant submits that the obviousness argument fails not least due to the

combination with the '872 reference as mentioned above. The Office refers to the '468 reference in support of the specific dimensions recited in the claimed invention. However, the applicant submits that this objection has no merit. The '468 reference discusses a carbon heater and this is far removed from fluorine-cleaned plasma processing apparatus as claimed in the present independent claim 1. In any case, the '468 reference does not even disclose the claimed range. Whether or not the first and second thicknesses t_1 , t_2 are equal or otherwise, it is irrelevant to the independent claim 1 of the present application. We therefore request that the Office withdraws this objection. The fourth document, the '975 reference, relates to a method for producing flat wafer chucks. Again, this is far removed from describing fluorine-cleaned plasma processing apparatus and regardless of any disclosure of the dimension of a tubular heater, it will be appreciated that this is far removed from anything which approaches relevant prior art against the independent claim 1.

Again, the applicant respectfully submits that the claimed invention of claims 1-7 is, at least for the above stated reasons are patentably distinct from the cited references.

Applicant believes the above amendments and remarks to be fully responsive to the Office Action, thereby placing this application in condition for allowance. No new matter is added. Applicant requests speedy reconsideration, and further requests that Examiner contact its attorney by telephone, facsimile, or email for quickest resolution, if there are any remaining issues.

Respectfully submitted,

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